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THE WEEKLY SUMMARY OF CURRENT SCIENCE

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A SCIENCE SERVICE PUBLICATION

BIOLOGY

Antarctic "Summer" Study

► A BROAD PROGRAM of research, supported by \$3,175,096 in grants from the National Science Foundation, will begin in the Antarctic in October, Dr. Alan T. Waterman, NSF's director, reported in Washington, D.C. An independent Government agency, NSF administers the United States antarctic research program.

A large part of the funds will be devoted to special biological projects, including the study of mites, flies and lice that may have been brought into Antarctica by air currents.

October is the beginning of antarctic summer. About 120 scientists and technical assistants will spend the "summer" in Antarctica. Forty-three are expected to winter over there (summer in the United States).

The vast frozen continent has become "a unique laboratory for environmental studies," Dr. Waterman said, calling attention to the ten biological projects planned there for 1960-61.

Biologists are particularly interested in several of the primitive life forms there and the adaptation of life to an extremely rigorous environment.

A study will be made of the effect of the earth's rotation on the metabolic rhythm of plants. This growth rhythm becomes disoriented in some plants when they are placed in rotation counter to the earth's rotation. Investigators from the University of California at Los Angeles, by means of a drum rotating counter to

the earth's spin, hope to find out how this affects the timing and response of plant growth—whether the "biological clocks" of certain plants and animals are affected by external environmental factors or whether they are innate.

The metabolism of fishes and studies of plankton in fresh water lakes of the Antarctic also will be investigated. The salt and water metabolism of the native penguins there will be explored.

A party led by Dr. Albert P. Crary, chief scientist of the U.S. antarctic research program, will explore miles of the South Polar Plateau. A second party under Dr. Charles R. Bentley of the University of Wisconsin will take geophysical data on Ellsworth Island.

Dr. Crary's expedition will include some of the world's most seasoned antarctic scientists, with experience of at least seven traverses. Sveneld Eyteev, a Russian exchange scientist, now wintering at McMurdo Sound, will be among this valuable group of antarctic experts.

NSF's antarctic research money has been awarded to several Government agencies as well as many colleges, universities and scientific institutions, with the latter showing a steadily increasing interest. Several additional grants are expected to be made before the onset of the program in October. Total NSF support is expected to amount to about \$4,000,000.

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CHEMISTRY

Control in Living Cells

► CONTROL WITHIN living cells at the molecular level is opening a new concept of the chemistry of living things that shows that cells behave with a purpose.

This "chemical feedback" idea, modeled upon the electronic feedback so important in the extraordinary blossoming of electrical appliances, is the latest impact of chemistry upon living matter.

At the American Chemical Society, Dr. Van R. Potter of the University of Wisconsin Medical School, called chemical feedback the most significant finding since the development of the gene theory that explains how the stream of life is passed on from one generation to the next.

"It opens up a new world that Darwin never dreamed of," Dr. Potter declared, "yet it would have pleased him immensely."

Chemical feedback explains how living cells are able to behave purposefully. Modifications of the enzyme pattern can come about in single cells through the operation of feedback mechanisms at the molecular level. These processes underlie the purposeful phenomena seen at higher levels.

It has been found that if an organism that can make a certain amino acid is given that amino acid in its food, it promptly

ceases to make the substance provided for it. Therefore, Dr. Potter explained, it acts as if it were intelligent.

Dr. A. B. Pardee of the University of California at Berkeley told how certain mutants (changed varieties) of bacteria make large amounts of an enzyme that produces a compound that they cannot use and therefore have no need for. These mutants behave like idiots because their change has interrupted the feedback processes that enable the "wild" types to behave intelligently.

Discovery of a child with congenital defects that causes a non-purposeful reaction like the behavior seen in mutant bacteria was reported by Dr. James A. Bain of Emory University.

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Decontaminates Water

► WATER FROM A WELL purposely contaminated with radioactive materials can be purified with standard U.S. Army water purification equipment, scientists were told at the national meeting of the American Chemical Society in New York.

Don C. Lindsten and Richard P. Schmitt,

both of the U.S. Army Corps of Engineers, added aged nuclear bomb debris from an underground test, ground up very finely to simulate atomic fall-out, strontium-90 and other radioactive materials, to a brackish water well.

Three typical water-treating units, mounted on trucks for field use, were employed in the tests. These were a unit involving coagulation in a solids contact clarifier, diatomite filtration, and rapid sand filtration, an ion exchange unit and a permselective membrane electrodialysis unit.

The purified water produced by all three methods was well below the acceptable tolerance.

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Chemicals Washed Out

► DETERGENTS have long given trouble to chemists concerned with water purification. They have had no easy way of getting washing chemicals placed in water upstream out of drinking water used downstream.

But Dr. I. M. Abrams reported at the American Chemical Society meeting in New York that alkyl benzene sulfonates—the hardy part of detergents—can be almost completely removed from water by passing it through a plastic-like material A-102D, or Duolite. Dr. Abrams is a chemist with the Chemical Process Company of Redwood City, Calif.

The removal process utilizes ion exchange in which a harmless ingredient of one compound is released in exchange for the material collected.

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TECHNOLOGY

Atomic Achievements Aid Research and Industry

► CANCER RESEARCH and industry have been advanced by two achievements in atomic development at Oak Ridge National Laboratory in Tennessee: more economical production of cobalt-60, lowering consumer costs 80%, and the first known separation of gram quantities of osmium isotopes.

Better production methods for cobalt-60 developed by the Atomic Energy Commission at Oak Ridge allow the Government to make a profit on sales even at reduced prices.

This should encourage private commercial production, John Maddox, AEC isotope distribution specialist, told SCIENCE SERVICE. The Government would prefer that nuclear development become a function of private industry.

Cobalt-60 is a valued tool in the treatment of deep-seated cancers and for food preservation. It is used by industry for detecting structural defects in metal products, and in the production of plastics.

The stable osmium, now available for the first time in significant quantities, is of particular value in basic research. It will be used as a tracer to shed new light on the behavior and composition of matter, AEC scientists predict.

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MEDICINE

Man Has Two Brains

The brain's two hemispheres may be very similar in function and their relationship may contribute to mental disorder. Damage to one hemisphere may cause strange behavior.

► **EVERY MAN** has two brains—one right and one left.

Their respective roles and whether there is a relationship that may contribute to mental disorders is the subject of a research project being carried out by Drs. Bernice M. Wenzel and Robert D. Tschirgi of the University of California Medical School, Los Angeles.

The two hemispheres of the human brain are not only extremely similar in structure, the investigators point out, but because of extensive inter-connection they may be very similar in function. This is probably why we have difficulty at times discriminating left and right.

One approach to the problem has been to remove one brain hemisphere from experimental animals at birth and to compare their subsequent behavior and learning ability to litter mates whose brains were left intact. So far the animals have demonstrated no significant differences in behavior or learning ability.

It has been demonstrated elsewhere that the same procedure in adult animals re-

sulted in marked differences. Animals with only one hemisphere, for example, could not walk a straight line but walked in circles.

Human patients who have suffered severe damage to one side of the brain may demonstrate bizarre behavior. In some cases, for instance, they tend to lose awareness of the opposite side of their body, grooming only one side of the body and letting the other remain unkempt. They are unable to touch the other side of the body, as if there were a barrier.

All this suggests that complex inter-relationships between the two hemispheres are established in the learning process. Disruption of these interrelationships or imbalances in their function may be related to mental disorders, it has been thought.

The research continues in search of clues as to how the roles of the "two" brains may be involved in normal and abnormal behavior.

The project is being supported by the National Association for Mental Health.

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in 80,000 parts. The experiments showed that a diluted blue iodine can successfully treat and cure gastric and intestinal diseases.

Pure iodine is a dark gray crystalline substance with a metallic luster. To the non-chemist, it is familiar as a brown liquid in an alcoholic solution. When heated to moderate temperatures, iodine sublimates, forming a violet vapor that rapidly condenses to crystals on a cold surface. When added to a solution of starch, iodine produces an intense blue color. This reaction is frequently used as a test for detecting the presence of iodine.

Polyvinyl alcohol is a polymer prepared from polyvinyl acetate by the replacement of acetate groups with hydroxyl groups.

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MEDICINE

Electricity Revives Paralyzed Leg Muscles

► **PARALYZED LEG MUSCLES** have been made to function again by an experimental electrical device that shocks the muscles and makes them draw up.

These experiments, reported in Washington, D. C., by the Veterans Administration, are being made on several patients at the VA hospital in Hines, Ill. The patients carry a small transistor electrical stimulator at their belts.

The stimulator sends electrical pulses to the thigh and the peroneal nerve, thus turning a dragging foot into a sharply lifted one. When the foot is on the floor, a switch in the patient's shoe turns the electricity off.

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MEDICINE

Antibiotics Overused

► **A PROMINENT PHYSICIAN**, Dr. Maxwell Finland, professor at Harvard Medical School and physician-in-chief at Boston City Hospital, denounced the indiscriminate use of antibiotic drugs for minor ailments such as common colds at a hearing before the Kefauver Antitrust and Monopoly Subcommittee currently investigating high drug prices set by the pharmaceutical industry.

Dr. Finland said the unjustifiable use of the powerful new drugs causes an imbalance in the different types of bacteria to which the human body commonly is host.

The result, he said, is that antibiotic-resistant bacteria, not formerly the cause of serious infection, has become a new threat to health.

He blamed the misuse and overuse of antibiotics on the fact that the medical profession often depends for its information about drugs and their administration on the pharmaceutical company representatives. There is no objective body to evaluate the antibiotics, and doctors do not have enough time to study the facts for themselves, he said.

Authoritative reports "in respectable medical journals" often do not appear until the drug has been on the market and in use for quite some time.

He asked that a study section be set up

by the National Institutes of Health to evaluate drugs and advise on their proper use. "Under such auspices, the indorsement of inferior products that are not in the best interest of the public is much less likely to occur than when the support for testing the product is furnished by the individual producer."

Dr. Finland was questioned by the subcommittee on chloramphenicol, produced exclusively by Parke Davis and Company, Detroit, under the trade name Chloromycetin, which can cause serious reactions in the human blood structure.

He said that administration of this drug is best done with prior and concurrent blood tests.

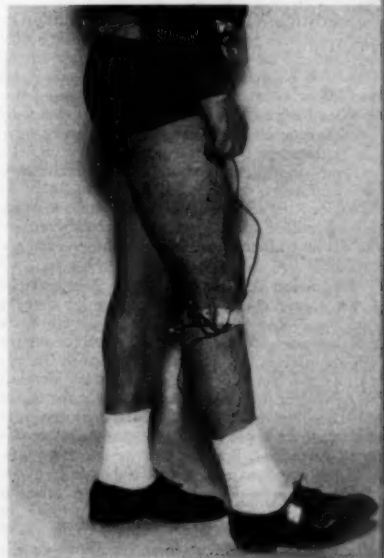
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MEDICINE

Blue Iodine Found Powerful Germ Killer

► **THE BACTERICIDAL** qualities of blue iodine, iodine in combination with polyvinyl alcohol, are many times higher than those of common iodine, according to the Soviet journal *Science and Life*, Vol. 27, No. 3, 1960.

In experiments with the blue iodine at a monkey nursery in Sukhum in the USSR, blue iodine was used after dilution to one



ELECTROTHERAPY—A Hines, Ill. VA Hospital patient feels his paralyzed leg come to life as he walks with aid of electrical stimulation. The wire connects with a switch that shuts off current when heel is off the floor.

SCIENTIA INTERNATIONAL

NOVAS DEL MENSE IN INTERLINGUA

Medicina Physic.—Un medico de Chicago ha discoperite que sensibilissime microphonos permette le differentiation del sonos producte per le articulation del genu secundo que illo es rheumatoide, osteo-arthritis, o normal. Le identification acustic de rheumatismo e de osteo-arthritis del genu es possibile, dice Dr. H. Fischer, multo ante que le roentgenogramma revela ulle alteration.

Physiologia de Plantas.—Pro retardar le florescentia de poinsettias per un decena de dies usque a Noel—normalmente iste plantas attinge le culmine de lor florition circum le 10 de decembre—il es solmente necessari interromper lor "somnia" durante un hora amne nocte inter le 22 de decembre e le 10 de october. On ha semper sapite que poinsettias es plantas de "die breve", i.e. que illos comencia formar lor flores quando le dies comencia devenir plus breve. In le effortio de exploitare iste facto, on ha frequentemente tentate le methodo de prolongar lor dies artificialmente quando on voleva retardar lor florescentia. Sed recercatores del Departamento de Agricultura del Stato de Ohio ha trovate post duo annos de experimentation que adder un hora o duo de lumine artificial al comenciamento e al fin del die natural es minus efficace in le obtention del mentionate objectivo que interromper de obscuritate del nocte a su medietate. Il pare que poinsettias es plantas de "nocte longe" plus tosto que de "die breve". Le mechanismo de iste phenomeno remane incomprehendite. Le plus estranie aspectu de illo es que le hora de luminositate medianocturne non ha a esser continue; il es possibile applicar in loco de illo un serie de subite pulsos de lumine con intervallos de un minuta. Isto rende le methodo multo plus economic, e on sape que in le Statos Unite le provision de poinsettias in flor a Noel es un grande industria.

Statistica Vital.—Le juvene americanos de ambe sexos es currentemente plus grande e plus pesante que lor parentes esseva a correspondente etates. Pro masculos le differentia de peso amonta a inter cinque e dece libras, pro feminas a inter dua e cinque. Omne isto es un del resultados de un studio effectuate per recercatores del statunitense Departamento de Agricultura. Le mesme studio etiam monstra—curiosamente—que homines e feminas qui profita (o ha profitate) de un education superior tende a esser plus grande e minus pesante que le alteres qui ha debite tontentar se de un education elementari.

Radiation Ionisante.—Certe scientistas russe—per contrasto con le majoritate de lor collegas occidental—insiste que alterationes structural de cellulas nervose non es le sol possibile neuro-effecto adverse de irradiation ionisante. In experimentos con canes illes crede haber demonstrate que le prolongate exposition a basse doses de radiation affice le memoria, reducente le capacitate de apprender e accelerante le "capacitate" de oblidar. Pro explicar iste constatactiones, le supra-mentionate russos ha elaborate le hypothesis que doses de radiation que non suffice a lesionar le structura del cellulas nervose es nonobstante sufficiente a disturbar e forsan a alterar permanentemente le metabolismo de ille cellulas.

Microbiologia.—Le investigation del question—de apparente satis academic—si actinomycetes es relate a bacterios o al fungos ha resultate in un discoperta de grande importantia practic. In recente annos milles e milles de differente actinomycetes ha essite studiate in le cerca de nove antibioticos, proque il es actinomycetes que produce le grande majoritate del jam cognoscite antibioticos de interesse medical.

In iste situation il ha devenite de plus in plus difficile classificar le actinomycetes, i.e., in altere parolas, il ha devenite de plus in plus difficile systematisar le cerca de nove antibioticos. On ha variamente tentate basar le classification de iste organismos super lor color e super lor structura, sed ambe iste criterios es variabile e lor estimation non pote esser liberate completamente de influentias subjective. Nunc recercatores al Universitate Minnesota ha trovate que actinomycetes revela lor affinitate o non-affinitate mutual in lor reaction al effecto de certe typos de virus. Le susceptibilitate e le non-susceptibilitate del actinomycetes al effecto destructive de typos specific de virus va esser le base de un nove classification in le mundo de iste plus importante productores de antibioticos. Viste que le typos de virus in question pare esser simile al typos de virus que es selectivemente destructive pro bacterios, le discoperta de Minnesota reforcia simultaneamente le conception que le actinomycetes es bacterios plus tosto que fungos.

Recercas de Sclerose Multiple.—Le apparentemente erratic distribution mundial de sclerose multiple se trova—secundo investigationes de Dr. J. S. Barlow del Universitate Harvard—in un frappante correlation con le latitude geomagnetic. Viste que le intensitate del radiation cosmic es le sol cognoscite phenomeno natural que es causalmente associabile con le latitude geomagnetic, Dr. Barlow ha formulate le these que sclerose multiple es causate (o co-causate) per le radiation ionisante del cosmo.

Antibioticos.—In Anglaterra un combination de processos natural con syntheses de laboratorio ha resultate in le disveloppamento de un specie de "super-penicillina" que se ha monstrate efficace contra staphylococcus resistente a altere preparatos de penicillina. Illo es tolerate per multe personas qui es allergic al penicillinas conventional. Illo essera lanceate al mercato sub le nomine de "Staphicillin".

Cardiologia.—In le vicinitate de Paris in Francia, le meticulous examine medical de un puera de 17 annos de etate ha resultate in le constataction que illa ha duo cordes. Le symptomas pro le quales illa cercava le consilio del medicos esseva extreme manca de energia e un excessivamente rapide fatigabilitate. Le medicos ha initiate un studio (que probabilemente va durar tres annos o plus) pro determinar si un del duo cordes pote esser extirpate chirurgicamente. Previamente un simile caso esseva reportate ab Yugoslavia ubi duo cordes esseva trovate in un juvene homine de 19 annos de etate quando ille se presentava al servicio militar.

Orthopedia.—Medicos del Administration de Veteranos experimenta con un apparato destinate a effectuar le electro-stimulation de paralytate musculos de gamba. Quando le assi stimulate musculos ha complite un movimento de marcha, le contacto del pede con le terra disrumpo le circuito electric, e un nove cyclo del mesme genere es comenciate.

Foresteria.—Le radices de duo o plus adiacente arbores de foresta se trova non infrequentemente connecte per un sorta de inter-graffage natural. Iste facto esseva stabilite in recercas al Universitate Wisconsin. Le phenomeno es quasi totalmente restringite a pares o gruppos de arbores del mesme specie. Ab le puncto de vista practic, le discoperta significa que in multe casos le "circulation" de un arbore individual non es realmente individual: le inter-graffage permette le passage de agentes pathogene e de substantias chimic de origine natural si ben que artificial.

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GENERAL SCIENCE

Reading Interlingua

► YOU CAN READ Interlingua if you had no more than one semester of high school French or Spanish or Latin and flunked it. You can read and understand a great deal of it even if you have never had contact with any foreign language.

Twenty-three medical journals regularly publish in Interlingua abstracts of their original papers.

Send this page to an acquaintance abroad and tell him that he can get additional information about Interlingua from Alexander Gode, SCIENCE SERVICE's Interlingua Division, 80 E. 11th St., New York 3, N. Y.

Financial contributions to the Interlingua program are needed.

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ASTRONAUTICS

Lab Reaches Into Space

► **REACHING FROM EARTH** to sun, a far-ranging program is getting under way at the newly-established Atmospheric Research Laboratory of the University of California, with the help of a \$600,000 grant from the National Science Foundation.

Scientists from many University departments will combine their special skills to probe some fundamental areas of space age research which have become too complex to be tackled by any one branch of science.

The laboratory, a part of the Institute of Geophysics and Planetary Physics, is headed by Prof. Gordon J. F. MacDonald, who will coordinate the research on both the Los Angeles and La Jolla campuses of the University of California.

Taking part in the laboratory projects will be professors and graduate students of physics, chemistry, geology, mathematics and meteorology, who will investigate atmospheric problems in three major areas:

1. Transfer of matter, momentum and energy within and across the boundaries of the earth's atmosphere.

2. The sun-earth relationships, especially unsolved astrophysical problems of solar emissions, plasma physics and the interaction of solar radiation with the high atmosphere.

3. Atmospheric dynamics, including the motion of planetary atmospheres, construction of mathematical and physical models of

entire atmospheres and the interaction of the earth's upper and lower atmospheres.

One of the laboratory's first major projects will be to investigate the atmosphere's response to the gravitational pull of the sun and moon, by means of spectrum analysis.

As a big part of this project, Dr. MacDonald and other researchers will analyze hourly barometric pressure readings, going back for 100 years, at stations throughout the world.

The checking of this huge mass of readings can only be handled by an electronic computer, and half of the National Science Foundation grant will be spent on computer operations. Most of the remaining money will be used for research and clerical personnel.

Besides its research activities, the laboratory will serve as an important study center for graduate students to meet the pressing shortage of young geophysicists and other scientists trained in the atmospheric sciences.

"These graduates are needed to solve complex research and engineering problems of vehicles operations in space and the upper atmosphere, to cite just one example," says Dr. Clarence E. Palmer, acting director of the Institute of Geophysics and Planetary Physics.

"We must train mathematicians, chemists and physicists who are not only specialists

in their fields but all-round scientists. In effect, we need a new scientific Renaissance Man to meet the challenge of the new age of discovery."

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GENERAL SCIENCE

October Will Spotlight Young U. S. Scientists

► **WHEN THE NATION'S** calendars are turned to Oct. 1, potential scientists in schools and communities all over the country will be spotlighted with the launching of the fifth annual observance of National Science Youth Month.

Leading national organizations will put special emphasis on programs designed to increase the quality and quantity of youthful ability in science.

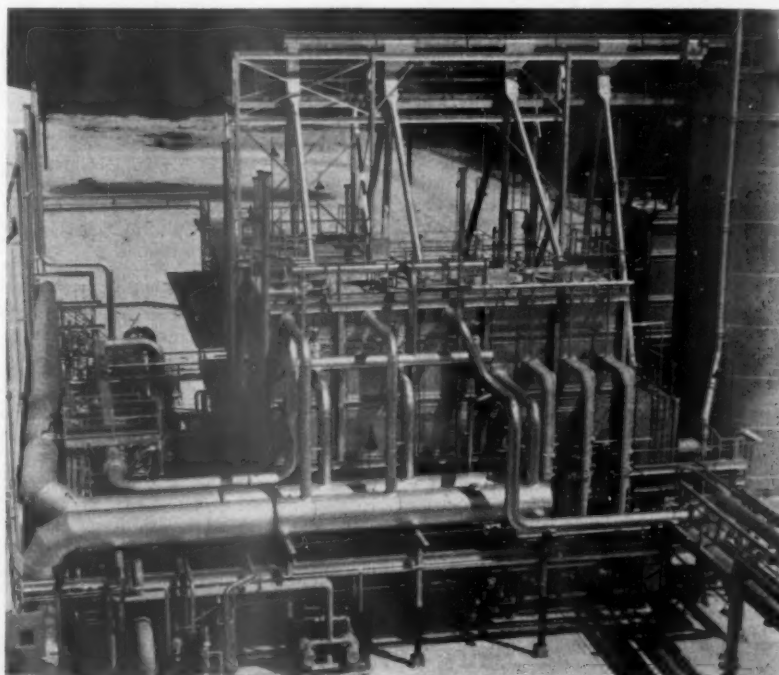
Help and encouragement offered by 34 agencies is being detailed in a brochure of information and suggestions issued by SCIENCE SERVICE, which coordinates National Science Youth Month as part of its science youth program. Local and regional groups wishing to participate in the observance may request the leaflet from SCIENCE SERVICE, Washington, D. C.

Many Science Clubs of America members will be working on projects for science fairs that will be held next spring. Science career seminars, how-to-do-it sessions, school science assemblies, and science programs for P.T.A. and civic club meetings are being scheduled as October highlights.

Interest in encouraging science-mindedness in America's students increases each year. Six additional agencies are cooperating in National Science Youth Month in 1960. These include: The American Heart Association, the American Institute of Biological Sciences, the American Pharmaceutical Association, the National Youth Conference on the Atom, the Optical Society of America and the Society of American Bacteriologists.

National organizations and activities continuing their support are: American Association for the Advancement of Science, American Cancer Society, American Chemical Society, American Dental Association, American Federation of Labor and Congress of Industrial Organizations, American Medical Association, American Veterinary Medical Association, B'nai B'rith Women Chamber of Commerce of the United States Department of Defense, Thomas Alva Edison Foundation, Engineering and Science Organizations, Junior Engineering Technicians Society, Manufacturing Chemists' Association, Inc., National Academy of Sciences, National Research Council, National Association of Manufacturers, National Aviation Education Council, National Committee for Careers in Medical Technology, National Merit Scholarships, National Science Foundation, National Science Teachers Association, New England Council, Oak Ridge Institute of Nuclear Studies, SCIENCE SERVICE, Scientific Apparatus Makers Association, U. S. Air Force, U. S. Army and the Association of the U. S. Army, and U. S. Navy.

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COLD BOXES—The heart of the Air Force liquid hydrogen plant near West Palm Beach, Florida, is this group of "cold boxes" where liquefaction of the ultra-cold fluid takes place. The plant, built by Air Products, Allentown, Penn., is capable of producing 60,000 pounds of liquid hydrogen a day.

PUBLIC HEALTH

Fruits Shed Strontium-90

► **FRUITS CARRY** a lower level of strontium-90, a harmful element of fallout from nuclear weapons, than vegetables, **SCIENCE SERVICE** was told by Dr. Edwin P. Laug, chief of the physiochemistry branch of the division of pharmacology of the Food and Drug Administration.

Dr. Laug has been evaluating radioactive strontium-90 levels in foods and exploring various ways to lower human exposure to this dangerous, long-lived element. The results of his findings may revolutionize current concepts of good diet.

He attributes the low level of strontium-90 in fruits to their relatively smooth skins from which particles of fallout tend to fall off. Also significant: most fruits grow on stems, branches or vines and are removed from direct contact with contaminated soil.

Strontium-90 often is referred to as "the bone-seeker" because, like calcium, it tends to settle in the bones of man and animals. Infants and children, whose calcium bone formations are not complete, are more susceptible to this known cause of bone cancer and leukemia.

Dr. Laug's studies have shown that whole grains, though higher in nutritional values and vitamin content than refined grains, also have a higher level of strontium-90. Deliberately contaminated whole wheat was as much as 75% higher in levels of fallout than the white wheat flour processed from it.

The vitamin-rich leaves of spinach are about four times as high in strontium-90 as the considerably less nutritional cabbage. The rough surface of spinach retains soil and atomic particles more easily than smoother cabbage or lettuce leaves. Generally, the outer leaves of the leafy vegetables, the skins of tubers such as potatoes and carrots, and the pods of peas and beans, all known to be richer in vitamins than their inner segments, have a higher fallout content.

The best way to reduce fallout in the

diet is to peel the skins of tubers, remove the outer leaves of vegetables or shell the legume variety, and thoroughly wash all fruits and vegetables before preparing them for the table. Just washing spinach, for example, reduces the strontium-90 content by 60%.

At current levels of fallout, there is no danger in maintaining present recommended eating habits. However, if nuclear testing should be resumed, the resulting increase of contaminating fallout might warrant abandoning the more nutritional and preferred whole grains for refined and processed grains. In any event, it may be wise to plan the diets of children so that foods with lower levels of strontium-90 predominate.

Dr. Laug pointed out that in the coming years, as nuclear reactors become more widely used as sources of energy, fallout from these sources will add to the contamination.

"I personally believe that fallout from nuclear reactors is potentially more dangerous than fallout from weapons testing," he said.

For this reason as well as consideration of the hazards from nuclear weapons testing, the Food and Drug Administration is experimenting with ways to reduce the dangers.

Progress already has been made in filtering strontium-90 from milk. Health authorities also are testing the possibility of adapting this process for home use. However, Dr. Laug believes that this never will be as efficient as industrial processing, which ultimately may prove the most practical and economical way of reducing radiation fallout in all foods.

Another way to effectively reduce radiation uptake of vegetables and fruits from contaminated soil is to lime the soil or add to its calcium content. Plowing also reduces fallout concentration at ground levels.

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radiation from the sun or trace elements in the soil.

If, after further research, positive links are found between cosmic radiation and incidence of the disease, Dr. Barlow said, protection may be effected by chemical agents "known to lessen biological effects of ionizing radiation."

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Radiation Affects Vision

► **HIGH ENERGY** radiation, even in very small doses, can damage vision, Dr. Leo E. Lipetz of the Institute for Research in Vision at Ohio State University, reported to the first International Symposium on the Effects of Radiation on the nervous system at Northwestern University's medical school in Chicago.

Dr. Lipetz said the response of the optic nerve in frogs was reduced after exposure to as little as one-half roentgen. This is the amount of radiation allowed per year for total body exposure of the general population under the Radiation Protection Guides established by the Federal Radiation Council.

Dr. Lipetz explained that the tiny amount of energy could have a large effect by triggering a series of reactions, "each one stepping up the effects, like an amplifier, of the previous one."

Other stimulating and damaging effects of high energy radiation on visual function have been shown, he said, in water fleas, crabs and rabbits, as well as people. Cancer patients, after a series of X-ray treatments, are more visually responsive to light.

• Science News Letter, 78:198 September 24, 1960

Radiation Hurts Unborn

► **DEVELOPING EMBRYOS** are especially sensitive to radiation, Dr. Roberts Rugh, associate professor at the Radiological Research Laboratory of Columbia University, has found. He told scientists meeting at Northwestern University's medical school in Chicago that the radiation effects may not be evident for generations.

Abnormalities of the central nervous system may be produced by irradiation of sperm cells or of egg cells before or after fertilization, or by irradiation at any stage in the development of the nervous system, the radiologist said.

"We cannot now state the extent—or duration—of irradiation damage to the developing central nervous system," Dr. Rugh said. He spoke at the first International Symposium on the Response of the Nervous System to Radiation.

In studies on mice, Dr. Rugh said he found a severe abnormality was produced in successive generations after a single radiation of sex organs.

The abnormality, a protrusion of the brain through the skull, also was produced by exposing the mouse embryo at any time up to eight days after fertilization in relatively low doses. The most common effect in progeny of survivors of the Hiroshima and Nagasaki atomic bombings is microcephaly (abnormally small brain).

• Science News Letter, 78:198 September 24, 1960

PUBLIC HEALTH

Sclerosis and Cosmic Rays

► **RADIATION** bombarding the earth from space may be a factor in the occurrence of multiple sclerosis, the Harvard University neurologist Dr. John S. Barlow believes. He told scientists of a world study linking the chronic disease with the amount of cosmic rays reaching areas of the earth.

Dr. Barlow spoke at Northwestern University's medical school in Chicago during the first International Symposium on the Response of the Nervous System to Radiation.

Multiple sclerosis, a disease known for more than a century, results from degeneration of the sheath-like covering that surrounds nerve fibers in the brain and spinal cord. It often causes severe crippling. Cause of degeneration is not known, and there is no specific treatment.

Dr. Barlow's statistical study of the distribution of multiple sclerosis shows that the frequencies of occurrence of the disease vary systematically with geomagnetic latitude. The intensity of cosmic radiation is the only phenomenon known to be related to geomagnetic latitude. Therefore, Dr. Barlow said, the possibility arises that cosmic rays might, in some way, be a factor in occurrence of the disease.

It is much more common in the northern parts of Europe and North America than in the southern areas; and it is extremely rare in the Orient, South America, Africa, the tropics or subtropics.

Other scientists have suggested that the mystery of the distribution of multiple sclerosis might depend on the amount of

PUBLIC HEALTH

Butlers' Blood Pressure

► THE QUIET imperturbability of the best butlers—including that of the royal butler who recently threw his hand in because he could not stand being called by finger-snapping—is often achieved at the cost of high blood pressure.

Dr. W. P. D. Logan, chief medical statistician to the General Register Office in London, reported that people in personal service suffer most from high blood pressure. Others in this group, besides butlers, include hotel and restaurant staffs, synagogue keepers, left-baggage clerks, photographers and water-closet attendants.

Dr. Logan's report is based on a survey carried out in cooperation with the College of General Practitioners. It shows the distribution of sickness among men, women and children, by occupation and social class, based on 280,000 clinical records.

Taking all occupations as 100, the proportion of people in personal service who consulted their doctor for high blood pressure was 147. The figure for store keepers was 134, while assistants in stores scored only 69.

Agricultural workers, with a score of 52, and miners, with 62, had the lowest ratios. Professional and executive groups scored 120 and 127, higher than average, while semi-skilled and unskilled workers were lower than average with 70 and 89.

Farmers and their workers have the healthiest jobs according to Dr. Logan's figures. Counting all kinds of illness, farmers had a ratio of 81 and other agricultural workers 80. By contrast, mine workers had a ratio of 124.

Farmers and their workers also suffer very little from psychoneurotic disorders. The figures scored for them there were 48 and 61 respectively, in comparison with 123 for professional and executive workers, office clerks 133 and plant foremen 127.

Agricultural workers are fortunate again in their experience of coronary heart disease. Here their ratios were 58 and 39, against 144 for store keepers, 139 for office clerks and 135 for plant foremen. For miners the proportion was 32.

• Science News Letter, 78:199 September 24, 1960

MEDICINE

Use Live Vaccine Booster

► THE SABIN oral live-virus polio vaccine, found suitable for government license by the U.S. Public Health Service, will make an ideal booster for persons who have had Salk polio shots, and appears to be safe and effective as a polio preventive for infants.

Researchers doing work with March of Dimes money from the National Foundation reported these findings which were discussed in a meeting of the Foundation's advisory committee on virus vaccines, Sept. 14, in New York City. The committee, which guides the Foundation in its vaccine research and policy decisions, met to consider problems concerning the use of the new vaccine in the United States.

Dr. John R. Paul of Yale University is conducting the experiments on dosage schedules. He reported that there is no evidence that persons who have had Salk shots should avoid Sabin vaccine. Dr. Joseph L. Melnick of Baylor University Medical School in Houston, Tex., said more strongly: "Those who have had Salk, without question can be given Sabin. In fact, they are the ideal group."

Two Foundation studies with newborn babies and young children on the effects of the vaccine have shown no ill effects on the young.

Dr. Martha Litson Lepow, who is assisting Dr. Frederick C. Robbins in polio research at Western Reserve University, Cleveland, said they began experiments to determine administration and dosage of Sabin in infants on Jan. 1, using 150 newborn infants and 75 babies three months of age. "It will take one year to be able

accurately to determine immunity effects of the vaccine relative to the time of life when it was administered," Dr. Lepow said.

Besides studies with infants, Dr. Melnick has begun tests on adults, using 650 prisoner volunteers.

Dr. Melnick's work with adults is expected to reveal to what degree viremia—the presence of poliovirus in the blood—occurs after the administration of Sabin vaccine.

With viremia there is a greater likelihood of the central nervous system being affected. In polio infections, the blood stream is the chief route by which the virus travels to the brain and spinal cord where it may cause paralysis.

Should Dr. Melnick's studies show that viremia does occur often and to a considerable degree, authorities might have to consider whether live-virus vaccine is suitable, particularly for young adults and pregnant women, Dr. Thomas M. Rivers, the Foundation's vice-president for medical affairs, said recently. (For other stories about infant polio vaccination, see SNL, 78:101, August 13, 1960.)

• Science News Letter, 78:199 September 24, 1960

METEOROLOGY

Hurricane Donna Tracked by Radar

See Front Cover

► THE LADIES are expensive. Hurricane Donna and her sisters have cost hundreds

of lives and billions of dollars. The lives can be saved and the damage reduced—but that will take a lot of money, too.

Especially difficult to predict and warn of, even with advanced techniques anticipated in the future, will be storms such as Ethel, Donna's younger sister that came to life suddenly in the Gulf of Mexico. Gulf storms are dangerous because they can reach land within two days of their birth.

This is the word from the U.S. Weather Bureau as estimates of Donna's damage climb to more than a billion dollars and deaths in the United States and West Indies add up to more than a hundred.

But recently installed and highly expensive radar now enables the U.S. Weather Bureau to watch storms like Donna and Ethel better than ever. Donna, as shown on the cover of this week's SCIENCE NEWS LETTER, was tracked by radar engineers at the Raytheon Company's center at Wayland, Mass. Each circle in the picture is a 20 mile marker.

Carol, in 1954, was one of the most convincing arguments for this new equipment. After moving sluggishly off Florida and South Carolina, Carol dashed one night for New England, where citizens slept unaware. By noon, some city areas were under eight to ten feet of water.

Carol cost about \$500,000,000. But Diane, in 1955, topped that. And now Donna has over-reached both. Only twice in this century, before 1954, had the Northeast been in the path of severe hurricanes.

With the new equipment, a hurricane is usually noted first by radarmen at Cape Hatteras. But soon thereafter the hurricane can be seen on the big, \$300,000 radarscope in Washington. This radar has an effective range of about 250 miles—about 100 miles farther than earlier sets.

Radar data is combined with ship and hurricane reconnaissance plane reports. Prevailing weather conditions and knowledge of the turns and paths of earlier hurricanes are also used in the forecast of a new hurricane.

Soon data may also come from satellites. A Tiros weather satellite scheduled this year will be "partially operational." That is, some of the pictures will be rushed to the Weather Bureau for use in predicting storms' paths. A fully operational weather satellite called Nimbus is planned for 1962.

The satellites will probably help in predicting the paths of hurricanes. They will also provide early warnings and permit good estimates of a hurricane's size.

But they may also reveal information more precious still: data on the mysterious birth of the storms on or near equatorial fronts. Apparently the spin of the earth combines with other weather factors to produce these hurricanes—but scientists need to know more.

Some scientists have suggested that with this further data, man can diminish a hurricane's force by rainmaking—by causing rain to fall before a storm reaches an area and thus "starving" the hurricane.

(See also stories p. 201 and 78:90, August 6, 1960.)

• Science News Letter, 78:199 September 24, 1960

PHARMACOLOGY

May Not Be Allergic To New Type Penicillin

► THERE IS a good possibility the new super-penicillin developed by Beecham Laboratories in England may be tolerated by individuals allergic to the penicillin now commonly used.

The new drug, proved active against all strains of staphylococci tested at the National Institutes of Health, Bethesda, Md., caused no antibody response in the blood of individuals treated with it. Dr. Richard Aster of the National Institute of Arthritis and Metabolic Diseases made the antibody investigation.

The new synthetic penicillin is called Staphicillin. In other tests at NIH, it cleared up staph infections after regular penicillin and other antibiotics had failed. In one case, 35 days of Staphicillin therapy cured a nine-year-old boy who had had recurrent staph infections for most of his life—ten episodes of pneumonia, four of bloodstream infection and innumerable abscesses.

Bristol Laboratories has arranged with Beecham to distribute the new antibiotic in the United States.

• Science News Letter, 78:200 September 24, 1960

AEROMEDICINE

Man Can Fly "At Any Speed"

► THERE IS NO SPEED at which it will become impossible for a fit man to fly, Air Commodore W. K. Stewart, consultant in aviation physiology for the Royal Air Force, told the Fifth European Congress of Aviation Medicine in London.

"There is no medical barrier to man traveling at whatever speed the designers of aircraft could make possible," Air Commodore Stewart said. "Nor would there be any limit to the height of flight, provided medical and engineering scientists worked together."

• Science News Letter, 78:200 September 24, 1960

CHEMISTRY

Sound Waves Measure Fast Chemical Reactions

► SOUND WAVES can be used to measure more accurately the rates of fast chemical reactions, it has been found by a physicist at the University of California, Los Angeles.

Chemical reaction rates, the speed at which gases, liquids and solids combine or separate, are basic to an understanding of most substances and processes—from the formation of water to the workings of an internal combustion engine.

One way of measuring very fast reaction rates, those that occur in one-millionth of a second, is through sound waves, whose velocities change with the time of reactions.

Using a complex apparatus, UCLA research physicist Harvey Blend has developed a method for detecting very small changes in sound wave length and velocity, which in turn allows him to measure reaction rates more accurately.

Through a combination of optical, acoustical and electronic techniques, Mr. Blend has been able to measure changes in wavelength of two thousand five-hundredths of an inch, and changes in frequency of one cycle in a million. These measurements, taken together, represent a new high in accuracy.

In his apparatus, which he largely designed himself, Mr. Blend used two transducers to generate and receive sound waves. He sent his waves in short bursts to eliminate the echoes which had clouded measurements of earlier researchers.

Mr. Blend, who will join Sacramento State College in the fall as associate professor of physics, is experimenting in an area which has challenged chemists and physicists for more than 75 years.

By perfecting his measurements, Mr. Blend hopes to throw more light on the mechanism of chemical reactions, especially how molecules combine and separate during reactions.

• Science News Letter, 78:200 September 24, 1960

PSYCHIATRY

Twins Not Predisposed To Mental Illness

► THE CONFUSION of ego identity said to occur commonly among twins does not cause schizophrenia, the mental illness of confused identity, Dr. David Rosenthal, psychologist at the National Institutes of Health in Bethesda, Md., has concluded. Neither does it cause other psychiatric illness requiring hospitalization.

The Archives of General Psychiatry, Sept., 1960, published by the American Medical Association, cites Dr. Rosenthal's findings based on studies in Sweden and Germany. His figures show that the frequency of twins among schizophrenics is actually less than the estimated frequency of twins in the general population.

Dr. Rosenthal's conclusions challenge the theory of some authorities that maintains that twins are more likely to develop confusion of identity because they are dressed alike, treated alike and have more problems of sharing, especially of the mother, than their brothers and sisters.

• Science News Letter, 78:200 September 24, 1960

MEDICINE

Drug Inhaler Gives Relief From Migraine Headache

► A DRUG INHALER that can be carried in a pocket or purse gives quick relief to migraine headache sufferers, according to a report to the American Medical Association in Chicago. The Medihaler-Ergotamine is reported as "a very useful agent" by Dr. Robert E. Ryan of St. Louis in the Archives of Otolaryngology, September, 1960, published by the AMA. The Medihaler allows inhalation of small but effective doses of ergotamine tartrate, the drug commonly given by injection to relieve the pain of migraine headaches. Dr. Ryan says that 44 out of 60 patients who used the Medihaler obtained complete or partial relief.

• Science News Letter, 78:200 September 24, 1960

IN SCIENCE

NUTRITION

'Trap' in Corn Withholds Niacin From Body's Use

► CORN HAS LOTS of niacin in it, yet persons eating high-corn diets still get pellagra, a niacin-deficiency disease. Nutritionists and chemists, long puzzled over this paradox, now have a reason for it.

Donald D. Christianson, a U.S. Department of Agriculture researcher in Peoria, Ill., said five weeks of experiments with rats revealed a chemical trap in corn that captures the niacin.

The trap would release its grip on niacin, however, after alkali treatment, Mr. Christianson said. He added that there is a nutritional parallel to his experiments:

In countries where corn is used in tortillas there is less pellagra than in other high corn-consuming areas. In the manufacture of tortillas, an alkaline treatment is used. This may liberate the niacin.

• Science News Letter, 78:200 September 24, 1960

ANTHROPOLOGY

Brain Size Found for Man-Like Creature

► OREOPITHECUS bamboli, the ancient man-like creature who walked the earth in what is now Italy some 12,000,000 years ago, has had his skull pieced together and the cranial capacity determined.

His cranial capacity can "reasonably be regarded" as somewhere between 276 and 529 cubic centimeters, Drs. William L. Straus Jr. and Miguel A. Schon, anatomists of Johns Hopkins University in Baltimore, Md., who made the determination, reported in Science, 132:670, 1960.

The cranial capacity of the ancient Oreopithecus almost certainly falls within the ranges of variation of two of the great apes, the orang-utan and the chimpanzee, the scientists reported.

The cranial capacity is much larger than that recorded for any Old World monkey, they said.

The cranial capacity definitely identifies Oreopithecus as a member of the Hominoidea, the super-family that includes both the anthropoid apes and man and his immediate forerunners. The reconstruction, however, the scientists conclude, is of no help in deciding whether this creature belongs among the apes, man and his cousins, or in a family of his own.

The ancient skull was found in 1958 embedded in a coal mine at Baccinello, Italy. The many bone fragments were pieced together and a plaster reconstruction of the skull was made by the Swiss scientist, Dr. Johannes Hurzeler. An earlier specimen was described in the scientific literature in 1872, by Dr. Paul Gervais and wrongly identified as a monkey.

• Science News Letter, 78:200 September 24, 1960

DE FIELDS

NUTRITION

Refrigeration Alone No Assurance of Safety

► IMMEDIATE REFRIGERATION of food prepared in large quantities, as for church groups, school lunches, etc., does not assure safety from food poisoning bacteria, University of Wisconsin home economists have found.

Researchers Maxine McDivitt and Mary Hammer found that 100-portion lots of cornstarch pudding refrigerated in stock pots did not cool fast enough to prevent the growth of food poisoning organisms. In order to obtain sufficient cooling to prevent growth of and toxin production by staphylococcus aureus, it was necessary to split the pudding into three parts and cool each in a wide, flat pan.

The home economists said that to prevent bacterial growth, food should be cooled to less than 50 degrees Fahrenheit within four hours. But in their tests, the internal temperature of pudding in the 100-portion lots was above 50 degrees for six or seven hours.

Since splitting large lots of foods and then cooling them is not practical for most quantity food preparation situations, it is important to keep bacteria out of the food from the start by practicing proper sanitation, the researchers said.

They noted that puddings and pie fillings provide almost perfect places for bacteria to grow, and cases of food poisoning have been traced to such foods which were contaminated during preparation. Staphylococcus aureus is one type of bacteria which causes food poisoning.

The researchers added staphylococcus aureus organisms to puddings to determine the course of their development. In 33-portion lots cooled in shallow pans, there was only a slight amount of bacterial growth after some hours in the refrigerator. But the larger 100-portion stock pots contained about 35 times as many organisms as at the start of the refrigeration period.

• Science News Letter, 78:201 September 24, 1960

NUTRITION

Eat Leaves and Grasses Instead of Burning Them

► LEAVES AND GRASSES used as fodder for farm animals would be better used to feed man, a leading biochemist reported.

"Instead of burning or ploughing leaves under, or feeding them to ruminants, cud-chewing animals, and getting back about a tenth of the protein, we should process the leaves mechanically and get half to two-thirds of the protein as direct human food," N. W. Pirie, head of the biochemistry department at Rothamsted Experimental Station, stated in the British journal *Discovery*, Sept., 1960.

The processed leaves would have little

or no flavor of their own and could be eaten in many different forms, he said. They could be combined with flour for bread, and in many other ways with commercially prepared foods.

Too many potential sources of food are being either ignored, wasted or inefficiently used, the biochemist charged.

He said, "The amount of protein thrown away by discarding the residue from soya, groundnuts, coconuts and other products used to produce oil could supply as much as one-third of the protein required by the entire world population."

Microorganisms, rather than meat-producing animals, will be used in the future to meet the world demand for food, he predicted. "Half a ton of bullock will make a pound of protein, but half a ton of yeast will make 50 tons and will need only a few square yards to do it on."

Whatever changes may be made in food for the future, Mr. Pirie debunked the notion that eating will degenerate into swallowing a few pills. Three thousand calories, average adult daily requirement, will not pack into less than three-quarters of a pound dry. By the time it is presented in a palatable form, it will weigh about two pounds—what it does now.

Pests and disease rob the world of at least 56 billion dollars worth of produce a year, he said, "a figure that looks impressive even alongside military expenditures."

• Science News Letter, 78:201 September 24, 1960

PHYSIOLOGY

Milk, Egg Production Triggered by Same Cells

► THE PRODUCTION of milk in mammals is apparently regulated by the same group of brain cells which, in the reproductive process, controls the release of eggs in the female.

In the natural process of birth and the suckling of the young, physiological stimuli may act on this brain area so that milk secretion is initiated and maintained while egg production is temporarily held in abeyance.

This has been suggested in experiments at the University of California Medical School, Los Angeles, by Drs. Charles H. Sawyer, Charles K. Haun, Jessamine Hilliard and Harry Radford.

They found that electrical stimulation of a certain group of cells in the hypothalamic part of the brain of the female rabbit initiated the egg release process. Destruction of these same brain cells with electric needles activated secretion of milk.

It has also been demonstrated that the tranquilizer reserpine will block ovulation and induce milk secretion in rabbits.

The brain controls these various functions by sending chemical messengers to the pituitary or master gland. The pituitary in turn releases special hormones, each of which initiates activity in a specialized gland such as the ovary or milk glands.

It has been suggested that the chemical messenger which causes the pituitary to send out the ovulating hormone also blocks release of the milk-secreting hormone.

• Science News Letter, 78:201 September 24, 1960

METEOROLOGY

Heat of Hurricane Equals Ten Million Atom Bombs

► THE DESTRUCTIVE SWATH of Hurricane Donna testified to its great energy and destructive power, but here are impressive hurricane figures:

The heat liberated by condensing water during the duration of ten days of a typical hurricane is equivalent to something like ten million atom bombs. This is enough to supply all the electrical needs of the United States for the next 600 years.

A hurricane expends energy at the rate of several hundred hydrogen bombs a minute. A typical hurricane takes in about 20,000,000 tons of air every minute at its lower levels, with the air rising swiftly and thrown out at the top, some 40,000 feet above.

Even the energy release of a mild shower over a few square miles is comparable to that of one of the early atomic bombs. (See also story p. 199.)

• Science News Letter, 78:201 September 24, 1960

MEDICINE

Girl Has Two Hearts French Doctors Find

► SURGEONS at the hospital at St. Germain-en-Laye, Paris, have found that a 17-year-old girl has two hearts.

She is Carmela Felice, the daughter of an Italian house painter who moved to France from Bari last year. She has never been able to live a normal life.

Carmela has been unable to play with other children and has also had to be taken out of school. She is not deformed, but she becomes exhausted far too easily.

Hospital surgeons at St. Germain-en-Laye are beginning a three-year study to determine if an operation is feasible.

An earlier two-heart case has been reported from Yugoslavia, where a 19-year-old boy was so diagnosed when he was called for military service.

• Science News Letter, 78:201 September 24, 1960

AERONAUTICS

Navy Will Get Trailers To Ready Pilots for Air

► THE NAVY has contracted for mobile pilot ready rooms that can be moved to new airfields to quickly provide pilots with the specialized equipment needed before take-off.

The Grumman Aircraft Engineering Corporation of Bethpage, N.Y., and its subsidiary, Aerobilt Bodies, Inc., of Athens, N.Y., will build the 40-foot long, trailer-like units under an \$850,000 Bureau of Naval Weapons contract. There will be two of these for each ready-room facility.

One of the trailers will be a dressing room with equipment to check out the various systems of fully pressurized flight suits. The second trailer will be a briefing and pilot waiting room. The pilot may plug his pressurized suit into an outlet in the wall to obtain ventilation.

• Science News Letter, 78:201 September 24, 1960

ASTRONOMY

Five Planets in Evening Skies

Jupiter is very bright in October, but Venus is more than five times brighter. Saturn's rings and belts make an impressive display through a telescope, James Stokley reports.

► ALL of the five planets that ever become visible to the naked eye are in the evening sky during October, but they will not be equally easy to see. However, the accompanying maps will help you to locate two of them, at least.

These maps show the way the sky looks about 10 p.m., your own kind of standard time (add one hour for daylight saving time) at the first of October, an hour earlier at the middle and two hours earlier at the end of the month.

Early in the evening, soon after it gets dark, you will see a very bright object in the south, which is the planet Jupiter. It is in the constellation Sagittarius, the archer, and the planet is much brighter than any of the nearby stars. By the times for which the maps are drawn, it is near the horizon, about ready to set, and its light is considerably diminished.

A little to the left (east) and also in Sagittarius, you will find Saturn, another planet, which is less than an eighth as bright as Jupiter, although it still equals most of the bright stars.

Mars which is about 75% brighter than Saturn, rises in the northeast about 10 p.m. at the beginning of October, 9 p.m. at the end, so it does not quite get on the maps. However, it is in the constellation of Gemini, the twins, which is just below that of Taurus, the bull, a figure that is shown near the eastern horizon (on the map of the northern sky).

Venus Sets Before Twilight

Early in the evening Venus is visible low in the southwest, but it sets before twilight is entirely over so you only see it in the gathering dusk. It is about 5.25 times as bright as Jupiter so it shines brilliantly, even while there is still considerable glow in the sky.

The fifth and last of the naked-eye planets is Mercury, the nearest of all to the sun. For that reason it never gets very far away from the sun in the sky. On Oct. 15, it will be farthest east of the sun, and will remain a little above the horizon after sunset. It will be so low, however, that it will not be easy to locate. But if, about the middle of the month, you look toward the western horizon soon after sunset, see brilliant Venus and another and fainter object a little lower and to the right, the latter would be Mercury.

The brightest star in October is Vega, high in the west in the constellation of Lyra, the lyre. Second is Capella, in Auriga, the charioteer, in the northeast. Then comes Altair, toward the southwest, in Aquila, the eagle, a little to the left of Lyra. And above

Lyra (shown partly on the northern map and partly on the southern) is Cygnus, the swan, with the bright star called Deneb.

Low in the east Taurus is coming into view, with Aldebaran. This star, like the others mentioned, is of the first magnitude but its low altitude makes it appear fainter than it does when higher in the sky. This is true also of Fomalhaut, in Piscis Austrinus, the southern fish, which is low in the south.

Pegasus Rides the South

Higher in the south is Pegasus, the winged horse. It contains no first-magnitude stars, but it is a prominent constellation, mainly because of the four stars which form the "great square." If you know this, it is a help in locating other star groups. Actually only three of this stellar quartet are in Pegasus. Alpheratz, the one in the upper left-hand corner of the square, is in the neighboring constellation of Andromeda.

Many observatories over the country have regular nights on which they are open to the public, and now one of the most interesting things they have to show is the planet Saturn. The source of this interest

is the unique system of rings that surrounds the ball of the planet, which is some 75,000 miles in diameter. It is about 886,000,000 miles from the sun, and goes around it once in 29.5 of our years.

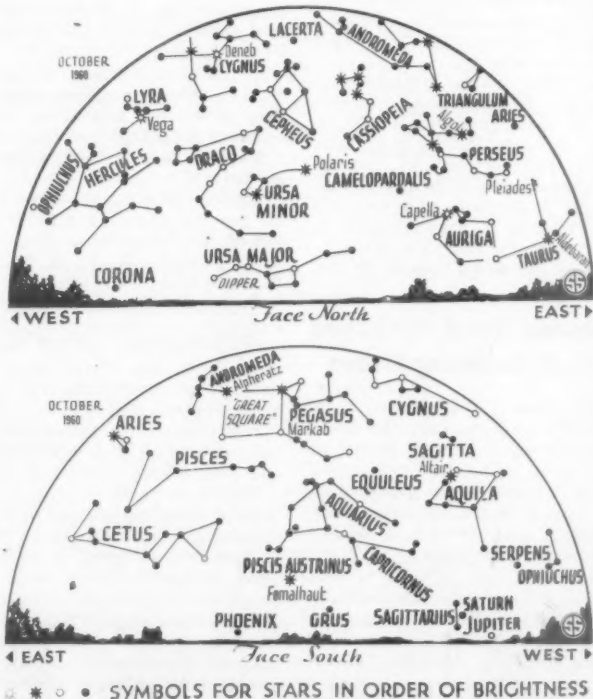
Through a telescope you can see belts on the planet. Similar belts—even more prominent—appear on Jupiter. Saturn has nine satellites or moons. The largest, appropriately called Titan, is 3,500 miles in diameter, larger than any other satellite. Moreover, it is the only moon on which an atmosphere has been detected.

But the really striking feature of Saturn is the beautiful system of rings. This is not a solid structure, as nothing solid would hold together under the enormous strains that would develop.

Instead, the system is really a swarm of tiny moons—some perhaps as large as golf balls, others no larger than grains of sand or dust particles. These are so close together that from our distance, which ranges from 746 million to more than a thousand million miles, we cannot see the individual satellites, and they merge together into continuous rings.

Squeeze Earth Through—Almost

The outside diameter of the ring system is 171,000 miles. With a total width of 41,500 miles there is a space of 7,000 miles between the innermost ring and the planet's surface, almost enough to let the earth squeeze through without touching.



• * • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Celestial Time Table for October

Oct.	EST	
3	8:34 p.m.	Algol (variable star in Perseus) at minimum brightness
4	5:17 a.m.	Full moon (Harvest moon)
11	5:00 a.m.	Moon passes Mars
12	8:00 a.m.	Moon farthest, distance 251,200 miles
12:26 p.m.		Moon in last quarter
15	5:00 p.m.	Mercury farthest east of sun
17:49 a.m.		Algol at minimum
18	4:37 a.m.	Algol at minimum
20	7:03 a.m.	New moon
21	1:26 a.m.	Algol at minimum
23	10:15 p.m.	Algol at minimum
24	3:00 p.m.	Moon nearest, distance 229,000 miles
5:00 p.m.		Moon passes Jupiter
25	4:00 p.m.	Moon passes Saturn
26	7:04 p.m.	Algol at minimum
27	2:34 a.m.	Moon in first quarter

Subtract one hour for CST, two hours for MST, and three for PST.

• Science News Letter, 78:202 September 24, 1960

PHYSIOLOGY

Rare Blood Group found in Australia

► A RARE new blood group factor has been discovered in Australia. It was found after an analysis of more than 2,000 blood samples, following discovery that the blood of members of two Brisbane families and a Red Cross blood donor were incompatible.

The Queensland Red Cross blood bank director, Dr. A. E. Shaw, said this was the second time such a discovery had been made. The first rare blood group called "Graydon," was originally found among members of a Melbourne family many years ago. The second blood group has not been named.

"The discoveries are the result of patient investigation over several years," Dr. Shaw said. "They will make the techniques of blood transfusion safer."

The American National Red Cross director of research, Dr. James H. Pert, said the new factor was unknown in the United States as far as he knew.

• Science News Letter, 78:203 September 24, 1960

Do You Know

If the eye has no other disease, over 90% of the patients undergoing cataract surgery will have their vision restored; when other diseases are present, at least two-thirds will regain sight.

A high-powered hydrogen gun, capable of shooting projectiles at a speed 20 times as fast as a .45 caliber bullet, is one of the weapons that scientists will use in their assault on outer space.

In the United States and Canada, more than 2,000,000 fires of all sizes, during 1959, destroyed close to \$1,400,000,000 worth of property.

The Great Wall of China took centuries to build and, when finished, stood 20 to 30 feet high, averaged 25 feet in thickness at the base, and was 1,400 miles long—equal to halfway across the United States.

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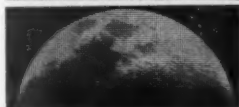
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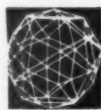
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ATLANTIC HURRICANES—Gordon E. Dunn and Banner I. Miller—*La. State Univ. Press*, 326 p., illus., \$10. Good reference work on hurricanes; covers formation, energetics, climatology, tracking and forecasting; contains charts, historical data and glossary.

CALCIFICATION IN BIOLOGICAL SYSTEMS—Reidar F. Sognnaes, Ed.—*Am. Assn. for the Advancement of Science*, 526 p., illus., \$9.75. Papers read at 1958 symposium organized by Sections of Dentistry, Medicine and Zoology.

COMMUNITY RESOURCES IN MENTAL HEALTH—Reginald Robinson, David F. DeMarche and

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CONGENITAL HEART DISEASE—Allan D. Bass and Gordon K. Moe, Eds.—*Am. Assn. for the Advancement of Science*, 364 p., illus., indexed, \$7.50. Papers presented at AAAS Symposium in December 1958.

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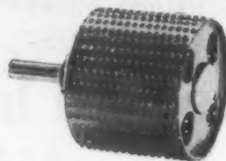
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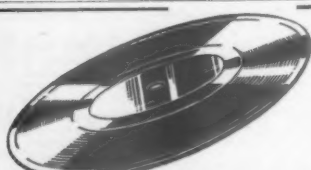
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Books of the Week

(Continued from p. 204)

THE NATURE OF HUMAN CONFLICTS, OR
EMOTION, CONFLICT AND WILL—A. R. Luria,
transl. from Russian and ed. by W. Horsley
Gantt, foreword by A. Meyer—Grove, 431 p.,
illus., paper, \$2.45. Reprint of study by well-
known Russian psychologist of "disorganization
and control of human behavior."

NEUTRON DETECTION—W. D. Allen—*Philo-*
sophical Lib., 260 p., illus., \$10. Detailed
account of main methods of neutron detection.

NEW WATER FOR A THIRSTY WORLD—Michael
H. Salzman, foreword by Aldous Huxley—*Science Foundation Press*, 210 p., \$5.95. Dis-
cusses urgent and universal problem of our
time.

NOISE REDUCTION—Leo L. Beranek, Ed.—
McGraw, 752 p., illus., \$14.50. Text and
reference book on the fundamentals of noise con-
trol, for engineers, non-specialists in acoustics.

NONMILITARY DEFENSE: Chemical and Bio-
logical Defenses in Perspective—Conrad E.
Ronneberg and others—*Am. Chemical Soc.*,
100 p., paper, \$2. Symposium papers dis-
cussing threat to this nation from chemical
and biological warfare agents.

A PICTORIAL GUIDE TO AMERICAN GARDENS
—Louis H. Frohman and Jean Elliot—*Crown*,
368 p., 400 illus., \$5.95. Divided into ten
regional sections, book's purpose is to direct
the motoring garden-lover. Contains index of
flowers, trees and shrubs.

THE PLASMA PROTEINS, Vol. 2: Biosynthesis,
Metabolism, Alterations in Disease—Frank W.
Putnam, Ed.—*Academic*, 518 p., illus., \$14.50.
Emphasizes physiological role and metabolic
interrelationships of the plasma proteins.

PRINCIPLES OF FEEDBACK CONTROL—Charles
H. Wills—*Addison-Wesley*, 271 p., \$8.75. Rig-
orous treatment of the analytical methods used
in the design of feedback systems.

SAMUEL MORSE AND THE TELEGRAPH—Wilma
Pitchford Hays—*Watts, F.*, 66 p., illus. by R.
Mayhew, \$1.95. Biography for boys and girls.

SHAO—Robert M. McClung—Morrow, 96 p.,
illus. by L. Darling, \$2.95. Child's book about
the life-cycle of the last of the plains buffalo.

SIR ISAAC NEWTON: Scientist-Mathematician—
W. Robert Houston and M. Vere DeVault—
Steck, 48 p., illus. by B. Cobb, \$1.75. Explains
some of Newton's experiments and helps boys
and girls understand their importance.

SOCIAL DRINKING: How to Enjoy Drinking
Without Being Hurt by It—Giorgio Lolli—
World Pub. Co., 317 p., \$4.50. A physician
explains the effects of alcohol on the body and
mind, and the difference between harmless and
harmful drinking.

SPACE BIOLOGY: The Human Factors in Space
Flight—James Stephen Hanrahan and David
Bushnell—*Basic Bks.*, 263 p., illus., \$6. Com-
prehensive survey of research findings as man
explores the physical and psychological forces
beyond the life-supporting atmosphere of his
native planet.

SUPPLEMENTARY UNITS IN CONTEMPORARY
ARITHMETIC AND ELEMENTARY ALGEBRA—
Edwin I. Stein—*Van Nostrand*, 75 p., paper,
\$1. Junior high-school level.

WEATHER—A. O. Chesters—Educ. Supply
Assn. (Taplinger), 3rd ed., 96 p., illus., \$2.50.
Tells children about causes behind daily
changes in weather.

THE WORLD OF PHYSICS: Readings in the
Nature, History and Challenge of Physics—
Arthur Beiser, Ed., foreword by Edward U.
Condon—*McGraw*, 286 p., \$4.25. Group of
readings on special topics, indicating the way in
which ideas about them have grown and
developed, communicating some feel for the
personalities, thoughts and problems of noted
physicists.

• Science News Letter, 78:204 September 24, 1960

MEDICINE

Cancer, Smoking Link Indicated by Lesions

► A STUDY of precancerous lesions has provided a new link between smoking and cancer.

Dr. Oscar Auerbach of the Veterans Administration Hospital in East Orange, N. J., told the fourth National Cancer Conference in Minneapolis, Minn.: "In our studies, precancerous lesions have always been present in cases dying of lung cancer. Every one of these gave a history of having smoked. . . . In individuals dying of causes other than lung cancer with verified smoking histories available, similar changes are present."

The researcher said air-pollutants other than cigarette smoke seemed to have played only a minor role in the production of such lesions.

• Science News Letter, 78:207 September 24, 1960

Sarcolysin for Cancer

► PROLONGING OF LIFE for cancer patients with a tumor arising from sperm cells (seminoma of the testicles) has been made possible by the use of the drug sarcolysin (chloroethylaminophenylalanine) in Russia.

Dr. N. N. Blokhin, president of the USSR Academy of Medical Sciences, Moscow, reported to the fourth National Cancer Conference in Minneapolis, Minn., that since 1954, the Institute of Clinical Oncology has treated 86 patients who had previously undergone surgery for seminoma of the testicles. Success with sarcolysin in this country in treating breast cancer has been previously reported.

Sarcolysin was given in doses of 40 to 50 milligrams once in six to seven days with constant observation of the blood condition.

The Russian physician said that sarcolysin has a very active effect on this particular type of cancer, but no effect on other types of testicle tumors of different structure.

• Science News Letter, 78:207 September 24, 1960

Questions

ANTHROPOLOGY—Where was the ancient skull of *Oreopithecus* found? p. 200.

BIOLOGY—What effect may the earth's rotation have on the metabolic rhythm of plants? p. 194.

MEDICINE—What is the electrical device that enables persons with paralyzed leg muscles to walk? p. 195.

METEOROLOGY—What is the range of the new radarscope? p. 199.

Photographs: Cover, Raytheon Company; p. 195, Veterans Administration; p. 197, Air Products, Inc.; p. 208, Harbers.

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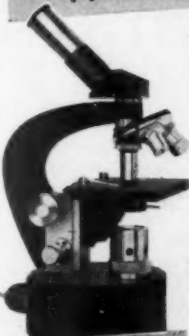
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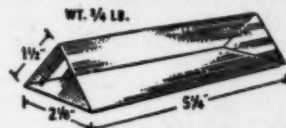
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✿ **LATTICE MODEL KITS** are now available for the building of lattices. These models provide excellent three-dimensional visual demonstrations of the crystal structure of matter for chemistry, solid state physics, and mineralogy. Different lattice models can be built to show the systematic arrangement of crystals and crystallographic properties.

• Science News Letter, 78:208 September 24, 1960

✿ **CREATIVE BUILDING BLOCKS** are a new educational toy for tots. With them anyone from five to 90 can create geodesic domes, houses, rockets, animals, trains, and a multitude of other structures. Made of sulphite colored panes, joined with rubber bands on flanged edges the blocks are beautifully designed and durable.

• Science News Letter, 78:208 September 24, 1960

✿ **CLOSET-DOOR CADDY** hangs conveniently inside any closet door, and stores neatly, soap, waxes, dust-pan, polish, laundry supplies as well as many other household commodities. This 20-inch by 60-inch plastic container has eight pockets and specially fitted snap-open loops for brooms and mops.

• Science News Letter, 78:208 September 24, 1960

✿ **TOE MUFFS**, plastic lined for extra protection, are designed to keep ice skaters' toes warm and dry. The muffs, shown in



the photograph, are easy to fasten to skates and will not slip off. One size fits all skates, and they are available with matching earmuffs.

• Science News Letter, 78:208 September 24, 1960

✿ **DISPOSABLE TORCH KITS** contain six disposable torch heads, six throw-away wicks, two five-foot torch standards, and two spiral metal torch head holders. Each

torch head is a can of fluid that burns from four to six hours, supplying bright light for any outdoor use. The cans are available in six-pack refills, complete with six wicks. The burning torches repel insects.

• Science News Letter, 78:208 September 24, 1960

✿ **DECORATIVE GLASS TRANSFERS** prevent persons from walking into glass walls and doors. The transfers are glue-faced and thus are put face down on the surface to be decorated and a paper backing removed. They are semi-translucent after installation. Many of the transfers are suitable for homes; others are designed for churches, hospital buildings and banks.

• Science News Letter, 78:208 September 24, 1960

✿ **FURNACE MUSIC UNIT** turns the hot air registers in a home into a speaker home music system. The unit is attached to existing radio, TV or record player and to a furnace plenum or dome. The mechanism resists heat and condensation. Its steel case keeps dust out.

• Science News Letter, 78:208 September 24, 1960

✿ **ODORLESS SHOE POLISH** took two years to develop, the manufacturer reports. Among the no-odor materials used in the paste polish is lanolin. The new polish is marketed in brown, black, tan, ox-blood, charcoal brown, cordovan and olive.

• Science News Letter, 78:208 September 24, 1960

Nature Ramblings

► **BETTER WATCH OUT**, 'cause if a spider writes your name in his web, you will die before morning!—Old superstition.

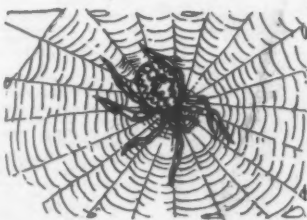
Many a boy has spent many an hour puzzling over the heavy white marking across the center of the garden spider's elaborate web. This marking does look superficially like writing, and with a bit of imagination you might make out a cryptic word from the zigzags.

But the spider is more engineer than sorcerer, and he is more interested in adding strength to his web by this thickened thread than in mystifying boys.

The spider's web may be his home, his automobile, his fortress, his nursery and his grocery shop. Not all spiders use their silk to capture prey. Most of them employ it in the preparation of a place to call their own. Dwellers in hidden recesses line their minute caverns with threads from their spinnerets. Trapdoor spiders hinge the plugs of earth that protect their little caves with strong webbing.

Young spiders are dispersed throughout the countryside by parachutes of silk. When

Come Into My Parlor . . .



they emerge from the cocoon (which is also made of silk) they typically climb to some high spot, then let out an abundance of thread called gossamer which is caught in the wind and carries them aloft. It does not take a stiff breeze—just a simple upward heat current will take the tiny aviator up and up. This traveling on gossamer wings explains how spiders turn up in some very surprising locations.

The best known function of the spider's web is, of course, as a means for trapping

and securing prey, though only certain of the spiders resort to this trick. The web trap may be a rather simple and disordered line of threads placed in a likely spot. But a great number of the web weavers make an elaborate and highly patterned web, capable of holding large prey. Each kind of spider has its own distinctive web design.

Typically, a web-waving spider will place his net across some open spot likely to be crossed by an insect.

When the web is spun, the spider retreats to an obscure spot, though keeping a line on the center of the web. As an insect strikes the net, the line to the spider is moved and this sends him quickly out to meet the prey.

If the insect is small, a quick dose of poison quiets its struggles and the spider dines immediately. If a larger prey is taken, there may be a struggle, with the spider lassoing the insect with copious amounts of thick silk. Thus bound up, the insect is kept to serve the spider for several meals!

—HORACE LOFTIN

• Science News Letter, 78:208 September 24, 1960

